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AIR COMMAND AND STAFF COLLEGE

AIR UNIVERSITY

BEYOND BLOOM, MEMORIZATION, AND REGURGITATION:

FORGING THE PATH TO A 21ST CENTURY PME



A Research Report Submitted to the Faculty

In Partial Fulfillment of the Graduation Requirements

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Abstract

The dominating teaching practices and instructional systems design (ISD) methodologies at Air Command and Staff College (ACSC), an intermediate developmental education (IDE) institution, emphasize memorizing static content, rehearsing procedures, and forcing new situations into existing models. Missed learning opportunities result from an education void of affective learning considerations, teaching for understanding, student buy-in, and authentic assessments needed to mimic real-world challenges. This paper explores the problem in an ACSC education, the importance of leveraging the affective domain, an approach to teaching for understanding, and a vision of outcomes for attending students who experience an education containing these learning elements.



In a collection of essays on leadership, former commander of Air Education and Training Command, General Stephen Lorenz, stated, “[I]n modern warfare, particularly during times of rapid change, education acts as a massive power multiplier. Today the US military needs flexible and innovative thinkers almost as much as it needs bombs and bullets.”¹ As the military approaches the tentative end of more than a decade of combat operations in Afghanistan, military senior leaders have openly remarked about remaking professional military education (PME) for the next series of challenges. To complement the emphasis on education, this paper focuses on Air Command and Staff College (ACSC), an intermediate developmental education (IDE) institution, where program ISD methodologies and teaching practices primarily concentrate on the cognitive domain of learning for ease of evaluation and assessment. To establish the boundaries, this paper will refrain from recommending what content the IDE institution should teach. It stands to reason that no matter what content practitioners choose as a PME foundation, “the process in which we deliver the content to leaders...(is) most likely the reason that leaders are not learning the skills they need to be effective.”² The dominating teaching practices and ISD methodologies emphasize memorizing static content, rehearsing procedures, and forcing new situations into existing models. This approach dulls thinking, creates predictable behavior, produces conformity, and traps students into comfortable routines.³ The missed learning opportunities in ACSC result from an education void of affective learning considerations, teaching for understanding, student buy-in, and authentic assessments needed to mimic real-world challenges. This paper explores the problem in an ACSC education, the importance of leveraging the affective domain, an approach to teaching for understanding, and a vision of outcomes for attending students who experience an education containing these learning elements.

Getting to the Problem

Before identifying the problem of IDE and building an educationally sound program, one must first describe the product of an effective education: the ideal officer. Second, one must explain how an institution, mandated to cover policy-driven education requirements, meets the educational needs of the force as a whole, maintains accreditations, and at the end of the day, produces a cutting-edge, in-resident IDE program for *high-potential officers*. Next, one must describe the problem holding the institution to the mechanical movements, used more for efficiency than student learning, of the current teaching practices and ISD methods. Last, one must explore other perspectives on problems within IDE that present relevant areas for further analysis.

The Ideal Officer

According to the Air Force Research Institute's Leadership Study team, "The next generation of Air Force leaders must expect to deal with a strategic environment characterized by increasing *volatility, uncertainty, complexity, and ambiguity* (VUCA) (emphasis added)."⁴ Majors and lieutenant colonels must bridge the three levels of war where status quo or off-the-shelf solutions may fall short in a VUCA circumstance or environment. The team continues with a description of such visionary and competent leaders:

These...leaders must envision desirable future organizations, share those visions while gaining input from their teams, and guide the implementation. (L)eaders must quickly sift through large amounts of data and make swift, confident decisions; they must step back and view problems with a flexible perspective; they must be broadly knowledgeable and experienced; and they must be emotionally resilient and aware of their own strengths and weaknesses. These competencies are intellectually grounded by the leaders' dedication to lifelong learning. For future Air Force leaders to succeed, they must develop a personal strategic decision-making process that is adept at incorporating rapid, unpredictable change (volatility), unknown circumstances (uncertainty), intricately interwoven decision factors (complexity), and vagueness about the current situation and potential outcomes (ambiguity).⁵

The Joint Force faces unique future challenges as the strategic environment increases in VUCA due in large part to the rapid changes of technology, rise in hostile nonstate actors, and globalization. However, the Joint Force possesses a combat-tested staff and student body with over 10 years of practical warfighting experience. Therefore, the time to educate the leaders who will lead through these VUCA challenges begins now.

PME Delivery to the Force

As the Air Force moves forward to achieve the *AETC Vision for Learning*, Air University must immediately implement the nonresident program, Officer PME (OPME) Transformation concept. This new standard for PME delivery meets policy-driven education requirements and administers a foundational, common-thread education to the force.⁶ Hailed as “education that delivers the right education to the right person at the right time,” OPME will drive changes to a system that currently fosters duplication of effort between distant learning and in-resident courses (i.e., many senior raters require completion of the equivalent distance learning course before receiving an endorsement to attend an in-residence IDE).⁷ The OPME initiative provides ACSC with a unique opportunity to refocus efforts toward an advanced, cutting-edge in-resident program, leaving OPME as the primary source of meeting the mandated education requirements required by policy. An advanced in-resident IDE program provides ACSC with opportunities to deliberately develop high-potential officers and restore the institution as a model of research, teaching, and original, innovative thought.⁸

The Problem

To find tomorrow’s leaders, today’s Air Force leaders place great value on IDE institutions identifying and labeling a portion within the ACSC student body as *distinguished graduates*. This contentious aspect of Air Force organizational culture drives ACSC to place substantial emphasis

on ISD methodologies and teaching practices designed largely for the cognitive domain to efficiently produce quantifiable assessments whereby all students can be equitably compared. Strategically, the overemphasis on cognitive development and quantifiable assessments yield negative effects by reducing student learning to memorizing and reapplying course content in evaluations graded primarily on use of course *buzz words*. Training students to memorize content, or information training, for later regurgitation robs students of mental agility and leaves them without concrete understanding of the subject matter.

For example, in a similar learning context, renowned college professor, Dr. Ken Bain, describes a physics course where students successfully employed *plug-n-chug* methods of learning. Professors later challenged the students on their true understanding of course concepts (in this case, ancient and modern theories of motion) and this is what they found:

(The students) had memorized formulae and learned to plug the right numbers into them, but they did not change their basic conceptions. Instead, they had interpreted everything they heard about motion in terms of the intuitive framework they had brought with them to the course. Many of the students still refused to give up their mistaken ideas about motion. Students held firm to mistaken beliefs even when confronted with phenomena that contradicted those beliefs. Perhaps most disturbing, some of these students had received high grades in the class.⁹

Teaching practices and ISD methodologies that solely focus on the cognitive domain and emphasize content coverage over concept understanding can produce “A” students who can plug the right vocabulary (buzz words) into a paper and string coherent sentences together, but lack understanding of the subject or important concepts and fail to see utility of the material outside of a classroom.¹⁰ The methods of the current system continue to produce “officers well-schooled in content, but unable to see beyond ‘what is’.”¹¹ Anecdotal comments from previous ACSC graduates express common complaints about the course: graduates can apply course concepts in course assessments, but graduate without understanding the relevance and utility of course

concepts outside of the IDE environment and find the information holds little-to-no value in their current staff or command assignment.

Other Perspectives on Officer PME

Postwar years are historically periods in the military where Services refocus, review, and reset efforts on educating officers for future conflicts. When discussing shortcomings in officer education, many notable authors present valid positions why Service education typically fails to prepare its officers for the next crisis. Their points represent relevant areas for consideration and further research to craft the best system of PME possible:

- PME still produces officers who are unfamiliar with other cultures and are constrained by Western values and methods of warfare.¹²
- “Personnel systems disconnect officers of intellectual excellence from critical jobs. The personnel system rewards active service, not demonstrated intellectual merit. Spend too much time thinking and reflecting and the rewards system denies promotion and opportunities to command.”¹³ The present personnel system allows strategic thinkers and high-potential officers to vanish in mediocre positions, and in turn decelerate promotions and career opportunities.¹⁴
- “Organizational culture and Service systems reward subordinates who mirror superiors, display amazing tactical aptitude, and can-do types who get things done by exhibiting managerial brilliance.”¹⁵ (PowerPoint prowess also brings suitable rewards.)
- Some view a government-financed civilian graduate program as the only true educational source capable of producing strategic thinkers, operators, planners, and leaders.¹⁶ The *action bias* “has caused our learning system to atrophy and become obsolescent...Where the Service schools were once education pioneers, military education now lags behind corporate and civilian institutions of higher learning.”¹⁷
- “Most disturbing is the disappearance of experienced officers as instructors.”¹⁸ Officers are keenly aware of an unwritten, but clear truth throughout the military that “very few superbly qualified faculty and staff at service colleges get promoted today. In fact, a teaching assignment is considered to be a career-ender by most officers.”¹⁹ Another group of officers risking career suicide, or stagnation, are those who aspire to complete an advanced academic degree and take the extended absence from their Air Force Specialty.
- Organizational culture values action and quantity over thinking and reflection leaving officers often too busy and too exhausted to learn.²⁰ The basis of the *action bias* claims, “Every mistake in war is excusable...except inactivity,” and is also misapplied to daily, garrison operations.²¹ The life-long learner must balance an exhaustive daily operations tempo with a desire to stay professionally relevant, knowledgeable of current events, and remain an active participant in his/her own family.
- The Air Force continually prefers technical education and operational training and expertise over intellectual and classical educations. The Air Force Research Institute

Leadership team found the first 10 years of an officer's service pre-dominantly career-focused to ensure technical mastery. Beyond the 10-year point, the Air Force encourages officers to seek a broader focus as they begin jobs on a staff or in command.²²

- A caveat within curriculum design suggests that all teaching and assessments, at all times, will fall short of deep and sophisticated understanding where a deep level of comprehension is neither feasible nor desirable.²³ (emphasis added)

Solving these valid challenges will require a devoted Service effort to overhaul the current personnel system and create policies to mandate changes within an entrenched organizational culture. The resources presently exist and leaders understand the need to change. Solving the PME problem to produce critically thinking, innovative leaders begins with educational approaches that enhance learning by incorporating affective considerations and teaching for understanding.

Why the Affective Domain is Important

The affective domain is a critical component in the learning process. After all, cognitive development, to a large extent, depends on the learner's goals, attitude, motivation, and self-concept.²⁴ The *affect* is a term "used to describe the feeling or emotional aspect of experience, associated with motivation of behavior; maintenance and enhancement of self-esteem in the educational setting; anxiety and achievement motivation; development of curiosity and a need to know and understand; and, social motives, such as a need for praise, recognition, and attention."²⁵ A student's affect acts as a filter during the learning process and influences learning predisposition that lends context to the adage that "what is taught is not the same as what students learn."²⁶ "When it comes to mastering skills, it is essential for students to exercise cognitive processes, but effective cognitive retention is marginalized if the affective domain is ignored."²⁷ Without extensive program or course-content modifications, institutions can take practical measures to increase a student's affective acceptance by granting student choices within programs of study and tailoring each course to student capabilities.

Over time, institutions removed affective considerations from PME lessons mainly for efficiency. Reviewing this Air Force Research Institute (AFRI) list, curriculum designers and teachers can create their own awareness for the variety of challenges found with affective objectives in education and why educators typically avoid affective considerations in curriculum:

- Affective results are long range and intangible.
- People fear the perception of brainwashing (blurring education and indoctrination).
- Outcomes can be ‘faked.’
- Assessment is largely subjective.
- Absence of behaviors is as important as presence.
- Some persuasive communication methods cause uneasiness.
- Definition and understanding of affect are imprecise.
- People disagree about affective behavior outcomes.
- Using computers to teach attitude seems Orwellian.
- The goal is efficiency, so affect is easily excluded.²⁸

While the AFRI list identifies valid concerns, institutions can work with students to formulate learning objectives, or outcomes, based on affective considerations to gauge student interests, beliefs, emotion, attention, motivation, and desires associated with program content. Since ACSC students compose an arguably homogenous group, educators, using interviews and/or surveys, can discover accurate and transferable affective objectives and determine outcomes for this distinct student body. However, institutions will gain the most *affective* success by incorporating student choices within course programs and tailoring courses toward student capabilities, interests, and expertise.

Adding affective considerations into course programs, like permitting students choices within programs of study, achieves multiple positive effects. First, to maximize course effectiveness, curriculum designers and teachers must understand the characteristics and principles of *adults as learners* to better understand their students, establish expectations, design programs of study, and teach course concepts. Adult education theorist, Malcolm Knowles, authored the following principles pertaining to the adult learner:

- Need to know why, what, and how;
- possess an autonomous and self-directing self-concept;
- prior experience is a resource and learning continues with established mental models;
- undertake learning with a readiness to cope effectively with real-life situations;
- oriented to learning on life-centered, task-centered, or problem-centered areas, as adults “learn new knowledge, understandings, skills, values, and attitudes most effectively when they are presented in the context of application to real-life situations.”; and,
- possess an intrinsic motivation to learn.²⁹

As Knowles explains further, permitting student choices maximizes student motivation, readiness to learn, and buy-in to the program.³⁰ Students fulfill internal, motivational desires by choosing areas that complement their educational background, existing expertise, previous training, career goals, and personal interests.

Next, a student-buy-in approach meets force needs by deliberately developing officers for highly desired areas of study and career paths required for Joint leaders. In-residence schools can achieve course outcomes by allowing officers to specialize in areas of study and hone expertise inside or outside of a primary Air Force specialty, to include: leadership, strategic-level studies, operational-level studies, cultural/linguistical/foreign-area specializations, cross-domain competencies, advanced functional-area expertise, and civilian institution advanced academic degrees (history, economics, international relations, etc). However, a cognitive-only focus, content-driven course, and content-coverage teaching practices create a *one-size-fits-all* education regardless of student motivation, goals, or capability.³¹ Institutions incorporating student choices into programs maximize outcomes by accounting for student affective learning needs.

Last, combining students’ educational desires with personal capabilities will meet Joint Force needs while enhancing organizational and mission effectiveness. Not every officer is destined for flag-officer rank or possesses the aptitude or desire for strategic-level study. By evolving the current *up-or-out* promotion structure for a system that leverages talents, expertise,

desires, and education, refined through PME, the force can place officers best suited for missions at the tactical, operational, or strategic levels of war at their position of maximum effectiveness. The very nature of an Airman drives the force to adapt and excel in dangerous circumstances: “[F]rom the earliest days of aviation, airmen have been regarded as members of an elite group, largely as a result of the dangers associated with flying. In the view of many, it took a special type of (person) to brave the obvious perils.”³² Allowing officers to cultivate and refine talents, interests, expertise, and education through targeted PME tracks, matches critical areas to Joint Force needs and ultimately links personnel capabilities to mission demands. This leveraging approach balances and matches talents within the force to critical mission or specialized knowledge areas and offers multiple highly valued career paths.³³

Despite the adaptive and courageous spirit that is the core of an Airman’s character, the Joint Force needs leaders who can think, plan, and solve complex problems. As a force, our *action bias* drives us to over-rely on our ability to succeed without planning in an all-too-common, *fly-by-the-seat-of-your-pants* approach to problem solving. This well-established trend of haphazard planning and ad hoc problem-solving is inadequate for the complex, long-term problems plaguing our force and a VUCA future. These complex problems require thinking officers who understand (or at least have the capacity for understanding) a VUCA environment.

Teaching for Understanding

In the *Joint Education* White Paper, Joint Chiefs Chairman, General Martin Dempsey, stated, “[j]oint educational approaches must adapt to stay relevant to how students learn best.”³⁴ Former AETC Commander, General Edward Rice, added in the *AETC Vision for Learning Transformation* White Paper, “[w]e must critically review the force development model to screen out antiquated processes, procedures, and policies while innovatively employing new

technologies.”³⁵ With senior leaders pushing to address inefficiencies, advocates for improved PME must exploit this opportunity to exact necessary changes.³⁶ To create an educationally advanced, cutting-edge in-resident PME, practitioners must incorporate ISD methodologies and teaching practices that move beyond student-information training. Institutional methods must instill mastery and concept understanding to develop and intellectually challenge Joint leaders.

Teaching and designing curriculum for understanding requires answering key questions to differentiate between current approaches and the proposed method. First, what is teaching for understanding and why is it important? Teaching for understanding moves students to relate what the students know or do to underlying and enduring principles, laws, theories, or concepts.³⁷ This precept poses important realizations for educational programs as it moves students to find personal, sensible, plausible meanings, and “verify, induce, or justify the content through inquiry and construction...leading to greater purposefulness and less mindless use of techniques.”³⁸ Next, what is understanding? Understanding, on a personal level, means “to make sense of what one knows, to be able to know why it’s so, and to have the ability to use it in (multiple, diverse, and complex) situations and contexts.”³⁹ An often overlooked component to understanding is *reflection*. Reflection for students in education involves thinking and interpreting course concepts, mental application of facts and principles, evaluation of personal values and attitudes, and assimilation and accommodation of new information.⁴⁰ Institutions will need to resist filling every moment of schedule *white space* with classes or activities (a habit of the institutional *action bias* used as an argument for *program rigor*) and allow for student reflection time on course concepts with *no-threat* assessments and/or journaling. Third, how does understanding differ from knowledge? Figure 1 provides a basic representation of the differences between possessing knowledge and understanding knowledge.

Figure 1. Knowledge versus understanding.¹

Knowledge	Understanding
<ul style="list-style-type: none">• The facts	<ul style="list-style-type: none">• The meaning of the facts
<ul style="list-style-type: none">• A body of coherent facts	<ul style="list-style-type: none">• The “theory” that provides coherence and meaning to those facts
<ul style="list-style-type: none">• Verifiable claims	<ul style="list-style-type: none">• Fallible, in-process theories
<ul style="list-style-type: none">• Right or wrong	<ul style="list-style-type: none">• A matter of degree or sophistication
<ul style="list-style-type: none">• I know something to be true	<ul style="list-style-type: none">• I understand why it is, what makes it knowledge
<ul style="list-style-type: none">• I respond on cue with what I know	<ul style="list-style-type: none">• I judge when to and when not to use what I know

To investigate knowledge or understanding, a teacher should move beyond “What are the facts?” to “What do the facts mean?”, “How can you use these facts?”, and “How do these facts (or theories) compare or contrast with the other (facts or theories) we have learned?” as a means to discover a student’s level of understanding (refer to Figure 2) of course concepts.

Fourth, what is the difference in *surface learning* and *deep learning*? Surface learning is typically defined by its characteristics. Logically, surface learning occurs as teachers present new or complex material. However, students should move toward deep learning as they shape personal meaning and context for the material and the teacher should accordingly adapt his/her approach.

Practitioners within PME should note the characteristics of surface learning to grasp where it originates, why it exists, when it persists longer than it should, and how to move beyond it:

- Assessment rewards students for taking surface approach, i.e., **assessments easily passed through rote memorization of facts or information lists**, or *plug-in-chug* methods.
- Students don’t receive accurate, adequate, or timely feedback on progress.
- Subject’s overall structure or connection between topics is unclear or hard to decipher.
- Subject, or course of study, doesn’t take student’s prior knowledge into account.
- Subject contains too much content for the time available leaving little time to engage in or reflect on new material or existing material in a meaningful way.
- Teaching is content-coverage focused; teacher persists in ill-suited pedagogical approach
- Teaching encourages cynicism, anxiety, or other negative feelings about topic(s).
- Students don’t see intrinsic value in subject; teaching doesn’t promote value of topic(s).

¹ Adapted from Wiggins and McTighe (2005), *Understanding by Design* (2d ed.). Upper Saddle River: Pearson Education, Inc., 38.

- Students past education successes used memorization-regurgitation methods.
- Students or teachers have other multiple commitments and commit to bare minimum.⁴¹

Additionally, unique problems within PME perpetuate the issue of prolonging surface learning: in-resident PME staffs, mostly military personnel without academic credentials, comprise the core faculty responsible for writing and executing curriculum; the staff is *trained* to look for *buzz words* in assessments as evidence of student learning which results in student conditioning toward what words or information lists to memorize, regurgitate, and then *flush*. Thus, students find the *path to success* by following directions (i.e., apply concepts to achieve the school solution with no incentive to produce original thought or otherwise innovate because innovation may actually result in assessed penalties).⁴²

With habits of surface learning formed during our early years of education, how do curriculum designers and teachers move ACSC toward *deep learning*? The following list presents ideas on how students learn, use knowledge, and build understanding of new or complex concepts:

- People learn by building mental models of reality rather than by merely *receiving* knowledge; they use their current models of reality to understand new things encountered.
- People don't store facts; they associate things in their brain; **learning to remember doesn't necessarily lead to improved reasoning; learning facts for an exam won't mean those facts will have much use after the exam or influence on the way people think, act, or feel.**
- **People learn the utility of the information by solving problems with real-world value and about which they care.**
- Students learn best when they feel a strong sense of control over their own education (creating student buy-in).
- People tend to learn most effectively if they face sophisticated, relevant challenges, but with little anxiety; grapple with important, real-world, or occupational questions that challenge their expertise; and, work collaboratively to brainstorm ideas where trial/error mistakes are encouraged.
- Learning to reason occurs and students benefit from challenges at a variety of levels.
- Emotions play a powerful role in learning and stimulating interest. (emphasis added)⁴³

The above ideas lead to the next step in moving education toward deep learning. As a means to measure understanding, articulate feedback, and provide visual reference points, curriculum

designers and teachers can utilize the *Six Facets Rubric* (Figure 2). The *Six Facets Rubric* compliments Bloom's Taxonomy (widely used in PME) and provides educators the means to articulate and gauge appropriate and reasonable levels of understanding during curriculum design, and evaluate student understanding of concepts, given the desired learning goals, while teaching.

Figure 2. Six-Facet Rubric.²

Explained	Meaningful	Effective	In Perspective	Empathic	Reflective
<i>Sophisticated & Comprehensive:</i> Fully supported, thorough, and justified; a deep, broad account	<i>Insightful:</i> powerful and illuminating interpretation or analysis	<i>Masterful:</i> Fluent; able to use knowledge and adjust understandings	<i>Insightful & Coherent:</i> Thoughtful viewpoint; effective critique	<i>Mature:</i> Able to see and feel what others see and feel	<i>Wise:</i> Deeply aware of boundaries of own and others' understanding
<i>Systematic:</i> makes subtle connections; goes beyond the obvious	<i>Revealing:</i> thoughtful interpretation or analysis of the meaning	<i>Skilled:</i> Competent in using knowledge and adapting understandings	<i>Thorough:</i> Fully developed and coordinated view	<i>Sensitive:</i> Disposed to see and feel what others see and feel	<i>Circumspect:</i> Aware of own ignorance and prejudices and that of others
<i>In-Depth:</i> supported theory, but insufficient evidence and argument	<i>Perceptive:</i> reasonable interpretation; provides a revealing account/context	<i>Able:</i> Limited, but growing grasp; adaptive and innovative	<i>Considered:</i> Reasonably critical and comprehensive look at major points	<i>Aware:</i> Knows and feels that others see and feel differently	<i>Thoughtful:</i> Generally aware of what he/she does/does not understand
<i>Developed:</i> incomplete account, limited support, but insightful ideas	<i>Interpreted:</i> plausible interpretation; retells the story as told	<i>Apprentice:</i> Relies on limited repertoire; able to perform well in simple contexts	<i>Aware:</i> Knows of different points of view; able to place on view in perspective	<i>Decentering:</i> Primarily limited to own reactions and attitudes	<i>Unreflective:</i> Generally unaware of own specific ignorance
<i>Naïve:</i> superficial account; more descriptive than analytical; un-examined hunch	<i>Literal:</i> simplistic or superficial reading; decoding w/ little understanding	<i>Novice:</i> Can perform only with coaching or relies on script	<i>Uncritical:</i> Unaware of different views; prone to overlook or ignore other perspectives	<i>Egocentric:</i> Has little or no empathy, beyond intellectual awareness of others	<i>Innocent:</i> Completely unaware of the bounds of own understanding and prejudices

² Adapted and condensed from Wiggins and McTighe (2005), *Understanding by Design* (2d ed.). Upper Saddle River: Pearson Education, Inc., 178-179.

The six facets “can help us clarify the desired understandings, the necessary assessment tasks, and the learning activities that will most likely advance student understanding. The six facets should remind us that *understandings* are not facts, and that certain learning actions and performance assessments are required to bring about the needed meaning-making by the learner.”⁴⁴ Teachers and students can expect more than *recalled* information and the Six Facets Rubric provides a method to measure the learning encounter and indicate if deep learning, or progress toward deep learning, as occurred.

For example, an ACSC Leadership and Warfare seminar finishes case studies on Billy Mitchell and Hap Arnold. The teacher asks, “Did Mitchell’s methods justify the results they ultimately produced or did Hap Arnold’s more patient approach actually achieve their goal of an independent air force?”⁴⁵ As the students discuss their opinions and express their answers, the teacher, if using the *Explained* column in the Figure 2 rubric, gauges student responses from *Naïve* up to *Sophisticated and Comprehensive* to determine student understanding. If the teacher had student responses to the question in an essay, the teacher could use the rubric to provide more objective and consistent feedback, using each column within the rubric, on the student papers. The teacher could then determine each student’s individual understanding of the concepts taught in seminar as compared to the level of understanding the lesson was designed to achieve.

The last element of teaching for understanding involves a key component, *authentic assessments*. Authentic assessments are educational tools used to exercise student-concept understanding and improve student performance (without entering the training realm) by mimicking real-world situations. Authentic assessments are powerful and may require students to create suppositions that run counter to common knowledge or accepted practices; violate published doctrine or accepted dogma; or, form and defend an original hypothesis.⁴⁶ Authentic

assessments meet adult learning needs, as described previously by Knowles, by using new information to enhance practical knowledge and expertise.

As a powerful tool to increase student affect, concept understanding, and class collaboration, authentic assessments can make class success or failure depend upon each member's research, calculations, and analysis. Each project component within an assignment can yield multiple positive results for students: 1) if the activity involves real-world problems that mimic the work of professionals in the discipline, students can present the findings to audiences beyond the classroom; 2) activities can enhance student skills in open-ended inquiry, research, critical thought, and metacognition; 3) students engage in discourse and social learning as a community of learners; and, 4) students are empowered through choice to direct their own learning in a relevant project.⁴⁷ Furthermore, by moving to authentic assessments, students emotionally invest and commit to the problem/project, exercise higher-order thinking skills as they learn, act independently without reliance on a teacher to deliver knowledge, and engage in a student-centered activity with the opportunity to create relevant experiences by solving real-world problems.⁴⁸ With some minor adjustments from ACSC, changing teaching practices and ISD methods to focus on teaching for understanding and incorporating authentic assessments meets students' affective needs for a relevant education and achieves the Chairman's and Service's strategic goals of producing effective Joint Force leaders.

Looking back, Air University used student independent research components as factors in class projects, but over time, moved toward more efficient, objective, and traditional assessment methods. Air University once used authentic assessments as a hallmark of education:

The core of our strategy...calls for reenergizing the university model of research and teaching that so effectively propels innovation in the civilian sector. This approach is not new to the Air Force. Throughout the 1930s, the Air Corps Tactical School employed it in an effort to confront the specter of a rising Germany and Japan and to develop new uses for

emerging airpower technology. Using a combination of theory, history, and field research, instructors at the school wrote the plan employed by the United States in World War II and **educated Airmen who developed strategies used by the Air Force for the next half century.** Unfortunately at some point during the Cold War, AU reduced its emphasis on this spirit of innovation and outreach to national policy makers. For the most part, the Air Force outsourced service related research on military strategy to independent think tanks, and the university became mainly a teaching school. This neglect of innovation has proved costly to the nation as well as to our faculty and students (emphasis added).⁴⁹

Air University, once again, can reclaim the spirit of innovation, research, original thought, and strategic thinking by transforming in-residence IDE through improved educational methods.

A Vision of Outcomes

If an educational program's purpose is to produce *ideal officers*, then the institution must cultivate the attending officers with an *adaptive expertise* where achieving a vision of outcomes in a VUCA future is second nature. These adaptive experts are leaders that possess distinctive characteristics: (a) "the attitude and aptitude to recognize and even relish both the opportunity and necessity for invention"; (b) "enjoy exploring the unknown and thinking in different kinds of ways"; (c) "appreciate their own knowledge, but they also realize how little they know in comparison to all there is to know"; (d) "constantly question their own assumptions"; and, (e) "avoid strong emotional attachments to any set of beliefs."⁵⁰ The future success of the Joint force and security of the Nation, expressed by General Dempsey's vision of the future Joint Force, depends on the extraordinary talents of men and women in uniform displaying the same leadership, innovation, courage, savvy, and initiative exhibited by leaders who guided the force in an era of firsts: radar, missiles, jet propulsion, compact nuclear weapons, space exploration, etc.⁵¹ This adaptive expertise, refined through education, must harness each officer's talents and galvanize these leaders for: jobs that do not exist; problems we don't know about; leading through incessant change; and, tomorrow's crisis.⁵² To produce this vision of outcomes in our officers, institutions must use ISD methodologies and teaching practices that move beyond transmitting

static information from sender to receiver. Institutional education must release the “captives of the military mind,” who can only recognize *what is*, and produce officers who can see beyond “the demands of today’s operational environment...(to) envision what ‘ought to be.’”⁵³

Conclusion

Teaching practices and ISD methodologies that primarily concentrate on cognitive learning for efficient and quantifiable assessments tragically and strategically limit the force. Rehearsing static content, memorizing procedures, and forcing new situations into existing models leaves officers woefully unprepared for a VUCA future. Limited approaches to learning, consistent with content-coverage teaching practices, dulls thinking, creates predictable behavior, produces conformity, and traps students into comfortable routines.⁵⁴ As a result, the missed learning opportunities in ACSC result from IDE void of affective learning considerations, teaching for understanding, student buy-in, and authentic assessments needed to mimic real-world challenges. The problem in an ACSC education is easily solvable; the importance of leveraging the affective domain is critical; the approach to teaching for understanding is within reach; and, achieving the vision of outcomes in the attending students is the path our nation deserves.

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- ¹ Lorenz, *Lorenz on Leadership*, 34.
- ² Williams, "Education for Critical Thinking," 49.
- ³ Murray, "Officer Education," 6; Williams, "Education for Critical Thinking," 51.
- ⁴ Currie, et al., *Air Force Leadership Study*, xi.
- ⁵ Currie, et al., *Air Force Leadership Study*, xii, 4.
- ⁶ Mosley, "Should We Teach Conformists or Heretics?," 5.
- ⁷ Air University, "OPME Transformation," 19.
- ⁸ Mosley, "Should We Teach Conformists or Heretics?," 5-6; Lorenz, *Lorenz on Leadership*, 35-36.
- ⁹ Bain, *What the Best College Teachers Do*, 22-23.
- ¹⁰ Bain, *What the Best College Teachers Do*, 24.
- ¹¹ Williams, "Education for Critical Thinking," 54.
- ¹² Scales, "Return of the Jedi," 1.
- ¹³ Scales, "Too Busy to Learn," 2.
- ¹⁴ Scales, "Return of the Jedi," 1.
- ¹⁵ Scales, "Return of the Jedi," 1.
- ¹⁶ Scales, "Return of the Jedi," 2; Currie, et al., *Air Force Leadership Study*, 40-41.
- ¹⁷ Scales, "Too Busy to Learn," 2.
- ¹⁸ Scales, "Too Busy to Learn," 2.
- ¹⁹ Scales, "Return of the Jedi," 4.
- ²⁰ Scales, "Too Busy to Learn," 2.
- ²¹ Weigley, *The American Way of War*, 295.
- ²² Currie, et al., *Air Force Leadership Study*, 25.
- ²³ Wiggins and McTighe, *Understanding by Design*, 9.
- ²⁴ Tharp et al., *Leveraging Affective Learning*, 5; Knowles et al., *The Adult Learner*, 64-67.
- ²⁵ Tharp et al., *Leveraging Affective Learning*, 5.
- ²⁶ Tharp et al., *Leveraging Affective Learning*, 5-6.
- ²⁷ Tharp et al., *Leveraging Affective Learning*, 6.
- ²⁸ Tharp et al., *Leveraging Affective Learning*, 7.
- ²⁹ Knowles et al., *The Adult Learner*, 63-67.
- ³⁰ Knowles et al., *The Adult Learner*, 184-185.
- ³¹ Mosley, "Should We Teach Conformists or Heretics?," 7.
- ³² Wells, *Courage and Warfare*, 4.
- ³³ Nagl and Burton, *Keeping the Edge*, 6.
- ³⁴ Dempsey, *Joint Education White Paper*, 5.
- ³⁵ AETC, "An AETC Vision," 8.
- ³⁶ Mosley, "Should We Teach Conformists or Heretics?," 7.
- ³⁷ Wiggins and McTighe, *Understanding by Design*, 230, 352.
- ³⁸ Wiggins and McTighe, *Understanding by Design*, 352-353.
- ³⁹ Wiggins and McTighe, *Understanding by Design*, 353.
- ⁴⁰ Knowles et al., *The Adult Learner*, 128, 192, 197.
- ⁴¹ Bain, "What the Best Teachers Do Summer 2010 Workshop," 14-15.
- ⁴² Mosley, "Should We Teach Conformists or Heretics?," 4; ACSC Seminar, 2013.
- ⁴³ Bain, "What the Best Teachers Do Summer 2010 Workshop," 15-16.
- ⁴⁴ Wiggins and McTighe, *Understanding by Design*, 103.

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- ⁴⁵ Mitchell, *Winged Defense*, v.
- ⁴⁶ Williams, "Education for Critical Thinking," 50.
- ⁴⁷ Rule, "The Components of Authentic Learning," 2.
- ⁴⁸ Rule, "The Components of Authentic Learning," 2-6.
- ⁴⁹ Lorenz, *Lorenz on Leadership*, 35-36.
- ⁵⁰ Bain, "What the Best Teachers Do Summer 2010 Workshop," 9.
- ⁵¹ Sheehan, *A Fiery Peace in a Cold War*, xviii, 206.
- ⁵² ACSC Lecture, 2013.
- ⁵³ Williams, "Education for Critical Thinking," 53-54.
- ⁵⁴ Murray, "Officer Education," 6; Williams, "Education for Critical Thinking," 51.



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